A study on the impact of reliable analysis-support learning on thermal physics education with the examination of the achievement in the physics classroom.

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ABSTRACT

Although students in Singapore receive formal science instruction in Primary 3 or 4 (age 9 or 10) and secondary school (age 13 to 16), they are exposed to thermal physics phenomena from an early age. Subsequently, understudies frequently structure elective or deficient logical originations connected with warm physical science a long time before they start learning it in the science homeroom. Because it does not take into account students' preexisting beliefs about thermal physics, the group of educators who participated in this study believed that traditional instruction would be largely ineffective. An action research process was used to see if students' thinking could be made more explicit through discussions and other social interactions using a more interactive and engaging pedagogical approach like authentic, inquiry-based learning. The following are the three intact classes of Secondary-3 students: an experimental group using Authentic Inquiry-Based Instruction (AIBI) and a high-performing control group using Traditional Physics Instruction (TPI).Although the high-performing control group continued to outperform the experimental group, students in the experimental group demonstrated significant gains in conceptual understanding and student self-efficacy. A deeper look at the data showed that students' conceptual understanding of the material taught in the AIBI classroom was correlated with their performance on standardized tests. Because they do little to cultivate students' self-efficacy and interest in the subject, traditional methods of instruction are ineffective. Instead of standardized tests at the end of each unit, authentic and formative assessment tasks should be incorporated into the curriculum more often.

Key word: Classroom, students' self-efficacy, pedagogical approach, score higher than students.